

# Large-Area, Self-Sufficient, Low-Cost MEMS Skin with Integrated Wireless Communication Capability, Phase I

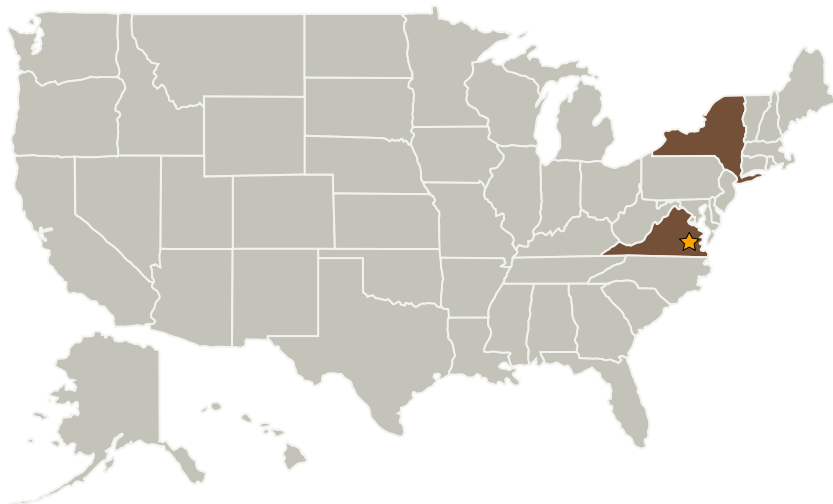
Completed Technology Project (2004 - 2004)



## Project Introduction

An integrated unit that harnesses its energy from its surroundings and reacts to, and transmits, any changes in its environment in a predictable and reliable manner would be of significant benefit to the sensor community. Advances in Micro Electro Mechanical Systems (MEMS), silicon, SiGe, and GaAs fabrication technologies have helped to constantly add new sensing and communication functionality in a given device footprint. A significant limitation with the current state-of-the-art processes though, is the constraint to fabricate devices and circuits on a relatively high-cost, defect-free, single-crystal, base substrate. This has also limited the potential of an integrated mixed-material design solution that is a key to high-performance communication systems. Finally, a lack of large-area processing tools has precluded the development of a stand-alone, large-area sensor skin. Building on Anvik's proven, large-area, excimer laser based recrystallization and annealing technologies, and ongoing efforts in developing MEMS process technologies on flexible substrates, we propose to develop a fabrication technology to enable wireless communication circuitry on low-cost, flexible base substrates for large-area "skins". There are several applications for this technology in free-moving sensor systems, space-based MEMS and distributed sensor networks for health-monitoring of space based systems, and commercial applications such as cell-phones and PDAs.

## Primary U.S. Work Locations and Key Partners



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## Organizational Responsibility

### Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

### Lead Center / Facility:

Langley Research Center (LaRC)

### Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★ Langley Research Center(LaRC)	Lead Organization	NASA Center	Hampton, Virginia
Anvik Corporation	Supporting Organization	Industry	Hawthorne, New York

Primary U.S. Work Locations	
New York	Virginia

## Project Management

### Program Director:

Jason L Kessler

### Program Manager:

Carlos Torrez

### Principal Investigator:

Marc Zemel

## Technology Areas

### Primary:

- TX09 Entry, Descent, and Landing
  - └ TX09.4 Vehicle Systems
    - └ TX09.4.6 Instrumentation and Health Monitoring for EDL